

Chapter Twelve

Butterfly Monitoring Protocol

IOWA BUTTERFLY MONITORING:

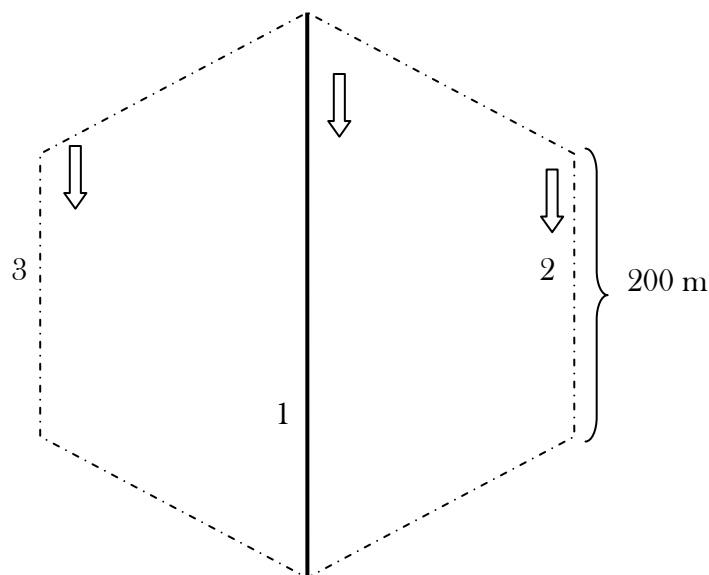
The primary butterfly survey method used in Iowa entails transect walking, following Pollard and Yates (1993). This transect should be 5 m in width and although the transect lengths may vary due to habitat features, the length should total to approximately 400 m. The transects are expected to pass through several different habitat classifications. Each habitat section should be labeled differently so that presence data can be linked to habitat data. The transect dissecting the sampling hexagon is 400 m in length. This transect should be considered the primary transect as it should cross through the designated habitat type. It is critical that the primary transect be surveyed with every visit to the sampling plot by the butterfly crew. Should additional transect distance be necessary then 1 (or 2) other 200-m transects should be walked as well during the same visit. These transects are also at a north-south direction and can be either the east or west side of the primary transect at a spacing of 173.2 m. For ease of effort, these extra transects connect the poles used in the bird point counts, stations #3 & 4 on the east side, and #6 & 7 on the west side. If either or both of the extra transects are to be used to replace part of the primary transect (due to a building being in the primary transect, for example), a decision should be made and recorded as to which transect will be used so that future crews survey the same area.

The primary transect can be divided into habitat sections and is the dividing line of the permanent hexagonal plot. Should a transect cross a road, this should be treated as a break between sections (Pollard and Yates 1993). The primary transect is 400 m in length. Transects should be flagged to ensure that the observer is in the correct area. Transects should be flagged every 10 m to ensure the same correct path is followed by various observers. It is wise to label flags with distances from the start of the transect to aid in data collection.

In addition to the transect surveys, a visual encounter survey should be done on the property on at least 2 visits for the butterflies. These surveys can be conducted anywhere on the property that appears to be the best habitat for butterflies, especially skippers and hairstreaks. The 'good habitat' encounter surveys should be 30 minutes in length. This information will be used to compile species lists for the property. The purpose of the additional effort is to document butterflies associated with a property in general, not necessarily the habitat it represents. Make sure that the appropriate location name or number is recorded on data sheet. The name for this 'good habitat' should be listed on the aerial photo in the map book created under the Landscape Characteristics protocol (Chapter 3).

SURVEY METHODS:

The primary transect follows the same path as the small mammal trap center line and connects the bird point count stations 2 and 5 while passing through point count station 1. Care should be taken to avoid attempting to walk the butterfly transect while mammal trapping is ongoing. The observer walks the transect between the bird point count station locations while searching an area 2.5 m on each side (for a total width of 5 m). All butterflies seen within the 5 m width and to a distance of approximately 5 m in front of the observer are recorded. The observer



should maintain a steady pace, unless a butterfly must be captured in order to be correctly identified to species. Individual butterflies should be counted only once. If the observer is unsure whether an individual is new or not, it should be treated as a new individual. Literature suggests that one will spend approximately 5 minutes per every 50 m with additional time being needed to record data and identify species (Ries et al. 2001). Use a stopwatch to record the amount of time spent, and always stop the time count when capturing or identifying an individual.

The butterfly season will begin June 1 and continue through August 31, depending on weather conditions. A cold start to the summer season will result in the delay of the beginning of the butterfly surveys. All transect searches will be conducted no earlier than 10 am and end by 6:30 pm on any given day. The temperature should be between 21° and 35° C (70-95°F) with winds less than 16 km/hr (~ 10 mph). Most surveys should be conducted on sunny weather days. Sites should be visited on 4 different occasions, each separated by at least 2 weeks such that each site is visited at least once in each month of June, July, and August. No human activity should occur in the survey area during the morning before the surveys are being conducted.

HABITAT & PLANT COMPOSITION DATA COLLECTION:

See Chapters 19 and 20. This information will be recorded under those protocols. No additional habitat information will be recorded as part of the butterfly monitoring protocol.

EQUIPMENT NEEDED:

- Compass
- Flagging & tall stakes in certain habitats
- Stopwatch
- Butterfly forceps
- Glassine envelopes
- Pinning kit
- Butterfly net

EQUIPMENT continued:

Hand lens

Field guides

Zip-lock baggies

Digital camera with macro lens

Dissecting scope (left in lab or office)

Standard field kit: Clip board, pencils, ruler, small scissors, Sharpie markers, hand sanitizer, & data sheets, nail polish or spray paint.

STAFF & TRAINING:

Two weeks of training is recommended and should include 1) field guide use and id, 2) trips to University museums to discuss defining species characteristics, 3) field practice with an experienced observer, and 4) proficiency testing. Technicians will also need training on habitat data collection.

DATA QUALITY & MANAGEMENT:

This protocol will be difficult to rate for quality:

- Examination of data will not reveal missed detections or misidentifications.
 - o Misidentifications could be checked by either the use of digital cameras, or by the field supervisor working periodically with each technician.
- Butterflies collected in the field will be double checked in the lab. See Additional Methods for Special Locations for information on collecting and preserving butterfly specimens.
 - o Skipper identification is difficult in the field or with photographs. These species will need to have voucher specimens collected.
- Crew member should be rotated such that each site is visited by more than one observer to reduce the effect of observer bias.
- All photographs should be reviewed by at least 2 additional people to verify species identifications.

At the end of each survey, each observer should review data sheets to ensure all information present. At the end of the week, the field crew leader should review the collected data sheets.

DATA ANALYSIS:

The basic information should allow the creation of a species list for each site, and data should at least be used to estimate the proportion of area occupied using program **PRESENCE** or **MARK**. For more information, see chapter 5 (Data Analysis). The data collected with this technique will be used to compute abundance indices when possible. However, given that different species will have differing detection probabilities, rigorous comparisons of abundance indices between species cannot be made.

SAFETY ISSUES & CONSIDERATIONS:

The butterfly transect technicians will be working alone and therefore should carry a reliable cell phone or radio, GPS unit, maps, and first aid kit. The crew or section leader should maintain a sign in/sign out method to ensure everyone returned from the field as well as to know exactly where each crew member is assigned to work every day.

TARGET SPECIES:

The following list of target species represents the species of greatest conservation concern as chosen by the Steering committee for the Iowa Wildlife Action Plan (Zohrer et al. 2005). Distribution maps for these species in Iowa can be found in Nekola (1995). Appendix 1 contains a list of additional, more common, butterfly species which may be encountered during the monitoring efforts.

Target butterfly species:

Common Name	Scientific Name	Habitat
Pepper and salt skipper	<i>Amblyscirtes hegon</i>	Edge of woods & grass waterways
Arogos skipper	<i>Atrytone arogos</i>	Prairies & grasslands
Dusted skipper	<i>Atrytonopsis hianna</i>	Bluestem grasslands & oldfields
Pipevine swallowtail	<i>Battus philenor</i>	Forest, open fields, & roadsides
Swamp metalmark	<i>Calephelis muticum</i>	Wet meadows & marshes
Common ringlet	<i>Coenonympha tullia</i>	Prairie & marsh edge
Wild indigo duskywing	<i>Erynnis baptisiae</i>	Roadsides
Sleepy duskywing	<i>Erynnis brizo</i>	Oak barrens, sand or shale soils
Dreamy duskywing	<i>Erynnis icelus</i>	Woodland or edge
Columbine duskywing	<i>Erynnis lucilius</i>	Rocky wooded ravines
Olympia white	<i>Euchlow olympia</i>	Open woods, river bluffs, poor soils, & grasslands
Baltimore checkerspot	<i>Euphydryas phaeton</i>	Wetlands
Two-spotted skipper	<i>Euphyes bimacula</i>	Sedge meadows & marshes
Sedge skipper	<i>Euphyes dion</i>	Sedge wetlands
Zebra swallowtail	<i>Eurytides Marcellus</i>	Woodland along rivers
Silvery blue	<i>Glaucopsyche lygdamus</i>	Open fields & woodland openings
Dakota skipper	<i>Hesperia dacotae</i>	Prairie
Leonardus skipper	<i>Hesperia leonardus</i>	Open grassy areas
Ottoo skipper	<i>Hesperia ottoe</i>	Mid- and tall grass, high-quality prairie
Purplish copper	<i>Lycaena helloides</i>	Moist or disturbed areas
Powesheik skipperling	<i>Oarisma powesheik</i>	High-quality tallgrass prairie
Mulberry wing	<i>Poanes massasoit</i>	Wetland fens
Broad-winged skipper	<i>Poanes viator</i>	Wetland fens
Zabulon skipper	<i>Poanes zabulon</i>	Riparian, oldfield, & woodland edges
Byssus skipper	<i>Problema byssus</i>	Tallgrass prairie
Acadian hairstreak	<i>Satyrium acadica</i>	Riparian & oldfield
Hickory hairstreak	<i>Satyrium caryaevorum</i>	Forest
Edward's hairstreak	<i>Satyrium edwardsii</i>	Woodlands, clearings, & areas of poor soil
Striped hairstreak	<i>Satyrium liparops</i>	Forest openings and edges, prairie streamsides
Regal fritillary	<i>Speyeria idalia</i>	Prairie & open grassland

ADDITIONAL METHODS FOR SPECIAL LOCATIONS:

Preservation of Voucher Specimens

Some species, especially skippers, will need to have voucher specimens collected for identification in the lab. Traditional chemicals used to preserve insects have been found to be hazardous to human health. Therefore the best method to preserve butterflies will be to collect them in glassine envelopes in the field, freeze them, at least overnight, in the envelope, pin them, and then re-freeze them for several days. They will not need to be stored in the freezer, but will need to be stored in a sealed Insect Drawer (see BioQuip.com catalogue).

Mark-Recapture

This technique would involve walking the transect several times during the same day or each day for several days in a row. All butterflies (or all butterflies of a target species) would be captured using a butterfly net and given a mark on the wing using either a permanent marker or a small dab of paint.

SUGGESTED FIELD GUIDES:

Glassberg, J. 1999. Butterflies through Binoculars: The East. Oxford University Press. New York, NY.

Heitzman, JR, and JE Heitzman. 1987. Butterflies and Moths of Missouri. Missouri Department of Conservation. Jefferson City, MO.

Marrone, G. 2002. A Field Guide to Butterflies of South Dakota. South Dakota Department of Game, Fish, and Parks. Pierre, SD.

Scott, JA. 1992. Butterflies of North America: A Natural History and Field Guide. Stanford University Press. Stanford, CA. (This one should be left in the lab or office).

LITERATURE CITED:

Nekola, Jeff. 2005. County distribution maps of Iowa Butterflies and Skippers. Department of Natural and Applied Sciences. University of Wisconsin, Green Bay, WI. 39 pp.

Opler, PA, and GO Krizek. 1984. Butterflies East of the Great Plains. Johns Hopkins University Press. Baltimore, MD.

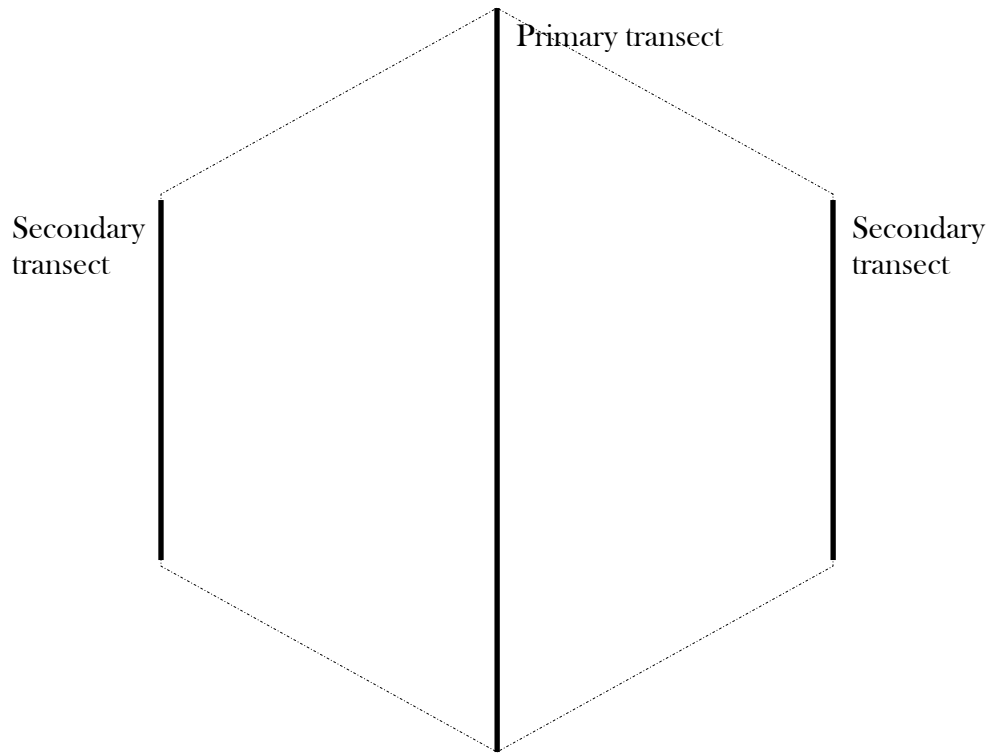
Pollard, E, and TJ Yates. 1993. Monitoring Butterflies for Ecology and Conservation: The British Butterfly Monitoring Scheme. St. Edmundsbury Press Limited. Bury, St. Edmunds.

Ries, L, DM Debinski, and ML Wieland. 2001. *Conservation Value of Roadside Prairie Restoration to Butterfly Communities*. Conservation Biology. 15(2): 401-411.

Zohrer et al. 2005. The Iowa Comprehensive Wildlife Conservation Plan.

Butterfly transect map. Observer:_____ Date:_____ Location:_____
Sketch habitats/section breaks/roads, also record whether the canopy is open or closed for each section of the transect:

Remember, each hexagonal side is 200 m in length and the dividing transect is 400 m long.



It may be possible to do this in the lab using the GIS database, however, this data should be ground-truthed on the first butterfly transect data collection. Subsequent data collection will not need to re-confirm this information unless conditions have changed (i.e. the site was burned or logged or plowed, etc.)

Butterfly transect data: DATE:_____ OBS:_____ pg___ of___
LOCATION:_____ VISIT #:_____ Start time:_____ End time:_____
Start Temp (C):_____ End Temp (C):_____ %clouds:_____ Rain:___ Wind spd:_____
Disturbance:_____ Comments:_____

[illegible]

Transect sections: 0-10m=1; 11-20m=2; 21-30m=3; 31-40m=4; 41-50m=5; 51-60m=6; etc.
 Act.: Activity: N=nectaring; F=flying; R=resting; O=ovipositing; B=basking; C=courtship.
 ID?: Relative certainty of ID: V=voucher; CR=capture & release; GS=good sight; S=sight; PS= poor sight.